

REMARKS

Favorable action on the merits is respectfully requested in view of the foregoing amendments and the following remarks.

I. CLAIM STATUS & AMENDMENTS

Claims 1-36 were pending in this application when last examined.

Claims 1-22 were examined on the merits and stand rejected.

Claims 23-36 were withdrawn as non-elected subject matter.

Claim 1 is amended. Support can be found in the disclosure, for example, in paragraphs [0141]-[0143] on pages 59-60, paragraph [0165] on pages 72-73, paragraph [061] on pages 26-27 and original claim 20.

No new matter has been added.

Claims 20-22 have been cancelled without prejudice or disclaimer thereto. Applicants reserve the right to file a continuation or divisional on any cancelled subject matter.

Claims 1-9 and 23-36 are pending upon entry of this amendment.

II. FOREIGN PRIORITY

In item 4 on pages 2-3 of the Action, the foreign priority claim was again denied on the basis that verified "translations" of the certified priority documents have not been received. It was indicated that Applicants should submit a translation of the foreign priority application certified priority documents, if they desire to obtain benefit of foreign priority.

Applicants will submit such in due course when appropriate.

III. INFORMATION DISCLOSURE STATEMENT

Kindly consider and return an Examiner-initialed copy of Form PTO 1449 for the IDS submitted to the Office on April 30, 2007.

V. PRIOR ART REJECTIONS

In item 8 on pages 5-8 of the Office Action, claims 1-9 and 20-21 were newly rejected under 35 U.S.C. § 103(a) as being obvious over Zhou et al. (Nucleic Acids Research, vol. 29, p. e93, 2001), in view of Delrio-Lafreniere (Molecular Diagnosis, vol. 6, p. 201, 2001).

In item 9 on pages 8 and 9, claims 10-13 were newly rejected under 35 U.S.C. § 103(a) as being obvious over Zhou et al. in view of Delrio-Lafreniere et al. in view of Scopes et al. (Analytical Biochemistry, vol. 49, pp. 88, 1972) and Benkoel (The Journal of Histochemistry and Cytochemistry, vol. 24, pp. 1194, 1976).

In item 10 on pages 10-11, claims 14-19 were newly rejected under 35 U.S.C. § 103(a) as being obvious over Zhou et al. in view of Delrio-Lafreniere et al. in view of Bille (Phys. Plantarum, vol. 84, pp. 250-254, 1992).

In item 11 on pages 11-12, claim 22 was newly rejected under 35 U.S.C. § 103(a) as being obvious over Zhou et al. in view of Delrio-Lafreniere et al. in view of Newton (US 5,525,494).

These rejections are respectfully traversed as applied to the amended claims for the reasons set forth in the last response and for the following reasons.

Since Zhou is the primary reference in all of these prior art rejections, these rejections will be addressed herein together.

Amended claim 1 now recites a method including a determination of a base type of a monobasic substituted region and also including a determination of a SNP pattern, wherein first and second base type determination primers, which have a different base at 3' terminal thereof, are utilized. Specifically, in step (a), a pair of solutions, i.e., a solution containing the first base type determination primer and another solution containing the second base type determination primer, is prepared. Further, in step (d), whether a SNP pattern is homozygous or heterozygous is determined based on the result of analysis in step (c), i.e., the progresses of the first and second base type determination primers.

The cited art references fail to disclose or suggest these features of the amended claims.

The primary reference of Zhou discloses a basic method for detecting a SNP contained in target nucleic acids. However, as noted at the bottom of page 6 of the Office Action, Zhou is silent on a primer whose second and third bases from the 3' terminal are uncomplementary to the target nucleic acids.

In this regard and as discussed in the response filed November 17, 2006, Zhou discloses, in Fig. 2, that a single base at a third position from the 3'-terminal of the primer is uncomplementary to a target nucleic acid. Zhou never discloses or suggest two bases in the “uncomplementary region”, which are uncomplementary to the target nucleic acids.

Accordingly, claim 1 excludes the primer of Zhou in that claim 1 clearly requires the second and third bases in the 3' terminal to be uncomplementary to the target nucleic acids (claim 1). In this sense, Zhou fails to teach or suggest each and every element of the claimed invention. Consequently, Zhou fails to anticipate or render obvious the claimed invention.

It is respectfully submitted that the secondary references of Delrio-Lafreniere, Scopes, Benkoel, Bille and Newton fail to remedy the deficiency in Zhou, because they too fail to disclose or suggest this feature of the present invention as recited in amended claim 1.

The Office relied upon as Delrio-Lafreniere as allegedly remedying the deficiencies of Zhou. However, it is respectfully submitted that the Delrio-Lafreniere fails to disclose or suggest this aspect of the claimed invention.

Delrio-Lafreniere discloses a method for simultaneously detecting wild type and mutant alleles in a single solution, wherein four distinct primers are mixed in the same solution. In particular, Delrio-Lafreniere discloses a result of assays in the case where a primer having mismatches at the antepenultimate and penultimate bases at 3' terminal is used (Table 3).

As shown in the bottom row in Table 3 of Delrio-Lafreniere, when the mutant primer having two mismatched based is mixed into the solution, amplification is not observed irrespective of sequences of the wild type primer. As understood from the experimental result, the primer having two mismatches at second and third bases from 3' terminal fully suppresses extensions of all the primers contained in the solution. Therefore, Delrio-Lafreniere clearly discloses that the primer having two mismatches cannot be used for a PCR reaction.

In contrast, the present invention has a feature in that the first and second base type determination primers are extended when the base at 3' terminal is complementary to a target base of a substituted region, while not being extended when the base at 3' terminal is uncomplementary to a target base of a substituted region. In the references relied upon by the Office, there is no disclosure or suggestion of this feature of the present invention, since the above-mentioned primer of Delrio-Lafreniere is not extended through PCR reaction.

Further, it is well established that the prior art must be considered in its entirety and that references cannot be combined where the references teach away from their combination. See M.P.E.P. § 2145 X, D, 2. A reference can be said to teach away when a person of ordinary skill in the art, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path taken by the applicant or if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant.

As discussed above, Delrio-Lafreniere teaches away from the claimed invention, because the reference clearly discloses that the primer having two mismatches cannot be used for a PCR reaction. For this reason, the prior art lacks a suggestion to combine the references to arrive at the claimed invention with a reasonable expectation of success.

Therefore, it is respectfully submitted that one of ordinary skill in the art would not have been motivated to combine the method disclosed in Zhou with the primer shown in Delrio-Lafreniere, since Delrio-Lafreniere only teaches a negative result of primer extension reaction when the primer has two mismatched bases at the second and third positions from 3' terminal, thereby guiding one of ordinary skill in the art to the contrary to the subject matter of the claimed invention. Instead, it is submitted that one of ordinary skill in the art would have thought that the primer of Delrio-Lafreniere, which cannot be extended, is not applicable to the method of Zhou.

Furthermore, none of the remaining cited references mention anything about bases in the second and third positions from the 3' terminal end that are uncomplementary to the target nucleic acids.

In this regard and as noted in the last response, Scopes was relied upon as teaching a method of detecting the conversion of organic phosphate into inorganic phosphate. Scopes mentions nothing about bases in the second and third positions from the 3' terminal end that are uncomplementary to the target nucleic acid.

Similarly, Benkoel relates to teaching the use of ferricyanide as an electron acceptor. Newton relates generally to labeling primers. Bille relates to a study of sphingosine as an inhibitor of protein kinase C. This reference also fails to mention anything about bases in the second and third positions from the 3' terminal end that are uncomplementary to the target nucleic acid.

Again, there is no teaching or suggestion in the cited references for having two bases in the “uncomplementary region” (claim 1) and “second uncomplementary region” (claim 20) that are located in the second and third positions from the 3' terminal of the first single-stranded nucleic acid as in the present invention, which are both uncomplementary to a target nucleic acid. invention. Such results are indicative of non-obviousness.

In view of the foregoing, it is respectfully submitted that the cited references, taken alone or in combination, fail to disclose or suggest each and every element of the claimed invention. The cite references also lack motivation and a reasonable expectation of success for modifying and/or combining their teachings to arrive at the claimed invention.

For these reasons, the above-noted 103(a) rejections of claims 1-22 are untenable and should be withdrawn.

CONCLUSION

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is in condition for allowance and early notice to that effect is hereby requested.

If the Examiner has any comments or proposals for expediting prosecution, please contact the undersigned attorney at the telephone number below.

Respectfully submitted,

Hidenobu YAKU et al.

By: _____



Jay F. Williams

Registration No. 48,036

Attorney for Applicants

JFW/mjw
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
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